

**STRUCTURE AND METHOD FOR FABRICATING SEMICONDUCTOR
STRUCTURES AND DEVICES FOR IMPLEMENTING CROSS-POINT
SWITCH FUNCTIONALITY**

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Abstract of the Disclosure

10 A semiconductor structure for providing cross-point switch functionality includes
a monocrystalline silicone substrate, and an amorphous oxide material overlying the
monocrystalline silicone substrate. A monocrystalline perovskite oxide material overlies
the amorphous oxide material, and a monocrystalline compound semiconductor material
overlies the monocrystalline perovskite oxide material. The monocrystalline compound
semiconductor material includes an optical source component operable to generate a
radiant energy transmission. A diffraction grating is optically coupled with the optical
15 source component and has a configuration for passing the radiant energy transmission in
a predetermined radiant energy intensity pattern, forming a plurality of replications of the
radiant energy transmission. The semiconductor structure further includes at least one
optical switch component optically coupled to the diffraction grating, where each optical
switch component corresponds to at least one of the replicated radiant energy
20 transmissions, and has a first state for passing the at least one replicated radiant energy
transmission, and a second state prohibiting passage of the at least one replicated radiant
energy transmission.

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